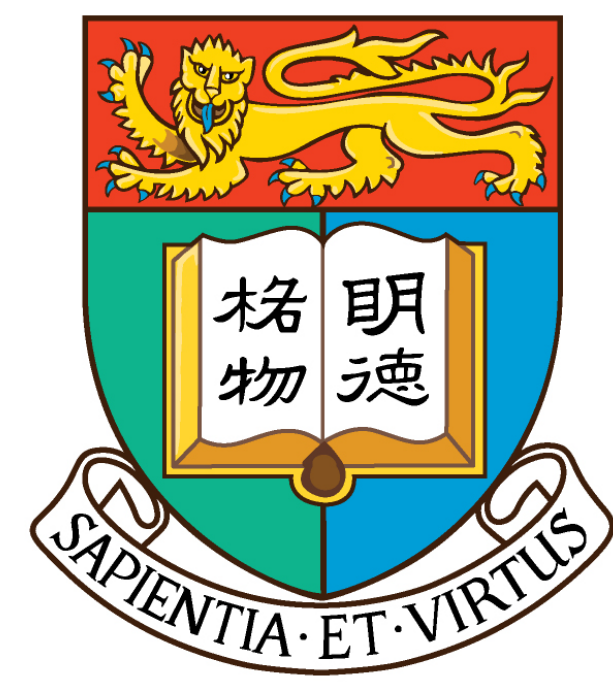




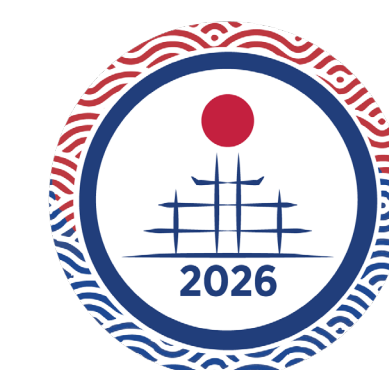
CA199 and CEA as Potential Prognostic Predictors in Patients with Pancreatic Cancer with Lung Metastasis

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INTRODUCTION

The biological behavior and prognostic implications of pancreatic cancer with isolated pulmonary metastasis (PC-IPM) versus isolated hepatic metastasis (PC-IHM) remain poorly characterized. This study aims to investigate the prognostic significance of serum CA199 and CEA levels in PC-IPM patients, with a comparative analysis against a PC-IHM cohort.

METHODS

Patients with pancreatic cancer were retrospectively identified from the Clinical Data Analysis and Reporting System (CDARS) database, covering the period from January 1, 2015 to December 31, 2024. Eligible patients were those with advanced pancreatic cancer who had not undergone radical pancreatectomy. Patients lost to follow-up were excluded, and the remaining patients were categorized into a PC-IPM cohort and a PC-IHM cohort based on their metastatic pattern. Clinical data collected included age, sex, BMI, smoking/alcohol history, CA199 and CEA measurements, and survival follow-up.

DISCUSSION AND CONCLUSION

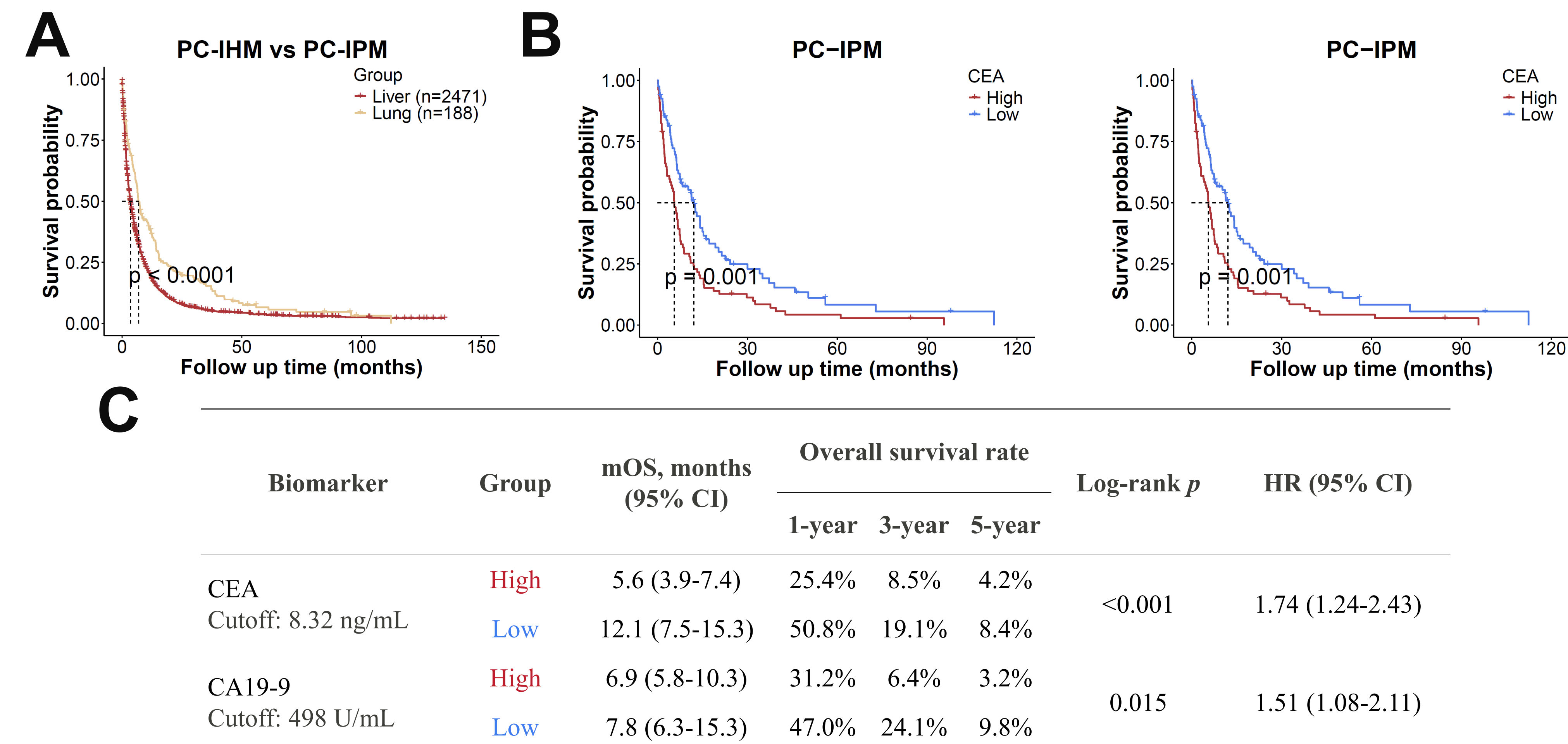
PC-IPM patients demonstrate significantly better survival outcomes than PC-IHM patients. Compared to CA199, CEA level appears to be a more informative prognostic predictor in PC-IPM patients. Regular monitoring of CEA levels, in conjunction with chemotherapy response assessment and stereotactic radiotherapy, may facilitate individualized adjustment of palliative treatment strategies and potentially improve patient outcomes.

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RESULTS

A total of 7,509 advanced pancreatic cancer patients were screened, with 188 (2.5%) classified as PC-IPM and 2,471 (32.9%) as PC-IHM. No statistically significant differences were observed between the two groups in terms of sex (56.0% vs 52.1%, $p=0.340$), age (66.3 ± 11.6 vs 67.8 ± 11.0 years, $p=0.097$), or BMI (23.9 ± 4.4 vs 24.0 ± 4.3 kg/m², $p=0.791$). PC-IPM patients demonstrated significantly longer median overall survival (mOS) compared to PC-IHM patients (6.9 months, 95% CI 6.2-10.3 vs 3.5 months, 95% CI 3.3-3.8, $p<0.001$). In biomarker-stratified analyses within the PC-IPM cohort, elevated CA199 (>498 U/mL) and CEA (>8.32 ng/mL) were each associated with significantly inferior OS. CA199-high versus low patients had an mOS of 6.9 vs 7.8 months and 1-, 3-, and 5-year OS rates of 31.2% vs 47.0%, 6.4% vs 24.1%, and 3.2% vs 9.8% ($p = 0.015$; HR = 1.51, 95% CI 1.08-2.11). A more pronounced prognostic separation was observed for CEA, with CEA-high versus low patients demonstrating an mOS of 5.6 vs 12.1 months and 1-, 3-, and 5-year OS rates of 25.4% vs 50.8%, 8.5% vs 19.1%, and 4.2% vs 8.4% ($p < 0.001$; HR = 1.74, 95% CI 1.24-2.43). Sensitivity analyses using ROC-derived cut-off values yielded consistent results.



(A) KM overall survival curves comparing PC-IPM and PC-IHM patients.

(B, C) Overall survival of PC-IPM patients stratified by CA199 and CEA level.